



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTOR: Pearce

TITLE: Process for Forming Gelatinous Elastomer Materials

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SERIAL NO.: 09/939,979

PATENT NO.: 6,413,458

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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OFFICE OF PETITIONS

09/383,979

Petition to Expunge

Honorable Commissioner:

This paper is a Petition to Expunge material from the case listed above. The material to be expunged is identified below. The material should be expunged from any and all of (a) the prosecution history, and (b) the issued patent. Expungement is appropriate because the material in question has been found by the OED to be a violation of MPEP 608.01(r).

MATERIAL TO BE EXPUNGED:

At column 1, lines 39-32 of the issued patent (U.S. Patent No.6,412,458) please expunge the following language:

"Mr. Chen's gel appears to be anticipated by two other prior art patents: U.S. Pat. No. 3,827,999 issued to Crossland and U.S. Pat. No. 5,618,882 issued to Hammond et al."

At column 48, lines 23-31 of the issued patent (U.S. Patent No.6,412,458) please expunge the following language:

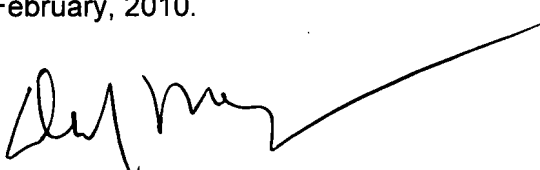
"The elongation at break value was mysteriously omitted from Table I of the '334 patent and other Chen patents. However, reference to Table I of Chen's first two issued patents (the '284 and '213 patents) sets the percent elongation of Chen's 4:1 material at about 1700. Applicant suspects that Chen omitted this data in later patent applications because it was either inaccurate or Chen's improved materials failed to exhibit improved properties over his earlier materials."

REMARKS

The undersigned submitted the above-identified case to the Office. Presently the undersigned is NOT counsel of record in the case and does NOT represent the owner of the case. However, the undersigned has been requested by the OED to pursue removal of the material in order to bring the case into compliance with MPEP 608.01(r). Accordingly, the undersigned respectfully petitions the Office to expunge the identified material. In the interest of full compliance with the MPEP, the material in question should be expunged in every instance where it occurs.

Prompt consideration of this petition is respectfully requested.

Respectfully submitted this 24 day of February, 2010.



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(12) **United States Patent**
Pearce

(10) **Patent No.:** US 6,413,458 B1
(45) **Date of Patent:** *Jul. 2, 2002

(54) **PROCESS FOR FORMING GELATINOUS ELASTOMER MATERIALS**

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(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) **Appl. No.:** 09/303,979

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(51) **Int. Cl.⁷** B29C 47/00

(52) **U.S. Cl.** 264/141; 264/171.1; 264/176.1; 264/331.13

(58) **Field of Search** 264/141, 176.1, 264/211.21, 330, 331.11, 331.13, 171.1

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(57)

ABSTRACT

A method for manufacturing a gelatinous elastomer article comprising a series of steps. The steps include selecting a plasticizer, selecting a triblock copolymer of the general configuration A-B-A, mixing the plasticizer and triblock copolymer such as by melt blending or use of a compounding screw in order to produce a gelatinous elastomer, permitting the gelatinous elastomer to cool, selecting a forming device such as a die or mold, melting the gelatinous elastomer, and forcing the gelatinous elastomer into the forming device in order to form a gelatinous elastomer part.

12 Claims, 74 Drawing Sheets

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PROCESS FOR FORMING GELATINOUS ELASTOMER MATERIALS

BACKGROUND OF THE INVENTION

A. Field of the Invention

This invention relates to the field of cushioning devices, gelatinous elastomers and devices made therefrom. More particularly, some embodiments of this invention relate to a cushion or cushioning device made in whole or in part of gelatinous elastomer, gelatinous visco-elastomer, and the elastomers themselves, methods for making any of the foregoing, and structures made from the foregoing and other cushioning structures and other devices including gelatinous elastomers.

B. The Background Art

In the prior art, there have been numerous attempts to provide a cushion which achieves comfort by eliminating peak pressure areas and by evenly distributing the cushioning force over a broad surface area. Some of these attempts include foam cushions, fluid cushions, flowable heavy gel cushions, lubricated microsphere cushions, thermoplastic honeycomb film cushions, traditional spring mattresses, and gelatinous elastomers generally. Examples of prior art gelatinous elastomers include the patents of John Y. Chen of Applied Elastomerics, Inc. of Pacifica, Calif. Some of Mr. Chen's patents include U.S. Pat. Nos. 5,884,639; 5,868,587; 5,760,117; 5,655,947; 5,633,286; 5,624,294; 5,508,334; 5,475,890; 5,336,708; 5,334,646; 5,324,222; 5,262,468; 5,239,723; 5,153,254; 4,618,213; and 4,369,284. Mr. Chen's gel appears to be anticipated by two other prior art patents: U.S. Pat. No. 3,827,999 issued to Crossland and U.S. Pat. No. 5,618,882 issued to Hammond et al.

SUMMARY OF THE INVENTION

It is an object of some embodiments of the invention to provide a cushion that distributes supporting pressure on an object being cushioned in a manner that is generally even and without pressure peaks. It is a feature of some embodiments of the invention that the cushion has a low surface tension and permits a cushioned object to sink deeply into it. This action is due to compressibility of the cushion. It is also a feature of some embodiments of the invention that some of the columns present in the invented cushion tend to buckle under the weight of the object being cushioned. This buckling is especially useful in accommodating protrusions from the object being cushioned into the cushion. The ability to accommodate protrusions through buckling of the cushion columns eliminates pressure peaks. It is a consequent advantage of the invention that the invented cushion is comfortable and does not tend to constrict blood flow in the tissue of a human being on the cushion, thus being suitable for medical applications and other applications where the object being cushioned may be immobile for long periods of time, such as in footwear, automobile seats, furniture, mattresses, and other applications.

It is an object of some embodiments of the invention to provide a cushion that eliminates the head pressure found in some fluid cushions. In fluid cushions, the flowable media may be drawn by gravity so that it exerts pressure on some portions of the cushioned object as the cushioning media attempts to flow in response to the gravitational force. This pressure is referred to as "head pressure." Head pressure can cause discomfort and tissue damage to a human using the cushion. The preferred embodiments of the invention do not develop head pressure.

It is an object of some preferred embodiments of the invention to provide a gelatinous elastomer from which

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cushioning devices may be made. Some preferred embodiments of the invention provide such a gelatinous elastomer with distinct strength advantages, elongatability, and bleed reduction compared to prior art gelatinous elastomers.

These and other objects, features and advantages of the invention will become apparent to persons of ordinary skill in the art upon reading the specification in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts one embodiment of the invented cushion as part of an office chair.

FIG. 2 depicts one embodiment of the invented cushion including its cushioning element and cover.

FIG. 3 depicts a cutaway of one embodiment of the invented cushion of FIG. 1 at 3-3.

FIG. 4 depicts a mold which may be used to manufacture one embodiment of the invented cushion.

FIG. 5 depicts an alternative mold for manufacturing one embodiment of the invented cushion.

FIG. 6 depicts a cross sectional view of a cushion manufactured using the mold of FIG. 5.

FIG. 7 depicts an isometric view of an alternative embodiment of the invented cushion.

FIG. 8 depicts a top view of an alternative embodiment of the invented cushion.

FIG. 9 depicts an isometric view of an alternative embodiment of the invented cushion.

FIG. 10 depicts a top view of an alternative embodiment of the invented cushion.

FIG. 11 depicts a cross sectional view of a column of one preferred embodiment of the invention during one mode of buckling.

FIG. 12 depicts a cross sectional view of a column of one preferred embodiment of the invention during another mode of buckling.

FIG. 13 depicts forces in play as a column one preferred embodiment of the invention buckles.

FIG. 14 depicts an alternative structure for a column and its walls.

FIG. 15 depicts a cross section of a cushion using alternating stepped columns.

FIG. 16 depicts an alternative embodiment of the invented cushioning element having gas bubbles within the cushioning media.

FIG. 17 depicts a cushion of one preferred embodiment of the invention in use with a combination base and container.

FIG. 18 depicts a cushion of one preferred embodiment of the invention having side wall reinforcements to support the cushioning element.

FIG. 19 depicts a cushioning element of one preferred embodiment of the invention having a girdle or strap about its periphery to support the cushioning element.

FIG. 20 depicts a cushioning element of one preferred embodiment of the invention with closed column tops and bottoms and fluid or other cushioning media contained within the column interiors.

FIG. 21 depicts a cushioning element of one preferred embodiment of the invention with firmness protrusions placed within the column interiors.

FIG. 22 is a frontal perspective view of an embodiment of the cushioning element of the invention which include multiple individual cushioning units.